Chapter 3: The Biosphere

Massachusetts State Standards

6.3 Use a food web to identify and distinguish producers, consumers, and decomposers, and explain the transfer of energy through trophic levels.

6.4 Explain how biotic and abiotic factors cycle in an ecosystem (carbon, oxygen, nitrogen, and water).

Key Terms

Autotrophs

Primary Producers

Consumers

Herbivores

Carnivores

Parasites

Detrivores

Decomposers

Omnivores

Scavengers

Ecosystem

Trophic Levels

Food Chain

Food Webs

Biomass Pyramid

Numbers Pyramid

Energy Pyramid

Primary Productivity

Biogeochemical Cycles

Water Cycle

Watershed

Groundwater

Carbon Cycle

Nitrogen Cycle

Nitrogen Fixation

Phosphorus Cycle

**You should be able to:**

1. Define ecology
2. Differentiate between the definitions of species, populations, communities, ecosystems, biomes, and the biosphere
3. Differentiate between biotic and abiotic factors, and provide examples of each
4. Explain how energy moves through an ecosystem and why
5. Identify the main source of energy for most life on earth
6. Trace the path of energy through a food web
7. Identify organisms in a food web based on their trophic level (producer? Primary consumer? Secondary consumer? Herbivore? Carnivore? Autotroph? Heterotroph?)
8. Define trophic level
9. Explain the 10% rule
10. Discuss how and where energy is lost as it moves through an ecosystem
11. Calculate the amount of energy or biomass available to organisms at different trophic levels
12. Describe where decomposers would be placed on an ecological pyramid and explain why
13. Explain how nutrients move through an ecosystem and why
14. Discuss the paths of nutrients in the 4 Biogeochemical cycles (water, carbon, nitrogen, phosphorus)

**You should know the difference between:**

* Autotrophs and heterotrophs
* Producers and consumers
* Biomass, energy and numbers pyramids
* Photosynthesis and chemosynthesis
* Herbivores, carnivores, and omnivores
* Detrivores and decomposers
* Food chain and food web
* Energy flow and nutrient cycling
* Evaporation, transpiration and precipitation
* Photosynthesis and cellular respiration
* Nitrogen fixation, denitrification, ammonification, nitrification

**Chapter 3 Video Review**

**Crash Course – Ecology**

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**Crash Course – Ecosystem Ecology**

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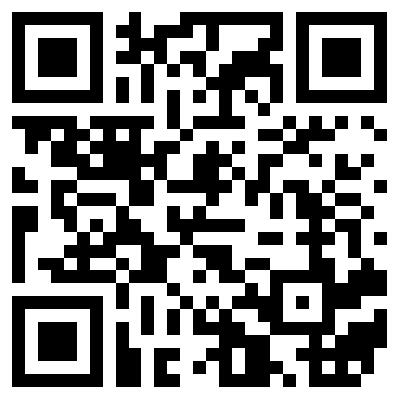
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**Crash Course – Water and Carbon Cycles**

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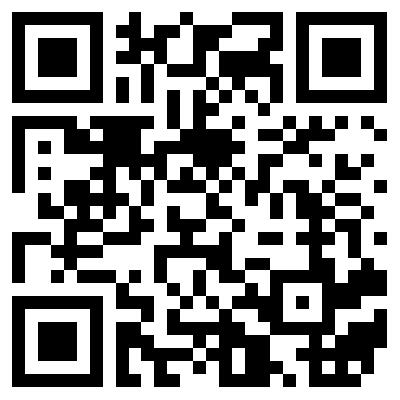
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**Crash Course – Nitrogen and Phosphorus Cycles**

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**Bozeman Biology – Biotic vs. Abiotic Factors**

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